MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

BDS2874 – MANAGEMENT DECISION SCIENCE

(All sections / Groups)

15 OCTOBER 2018
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **FIVE (5)** printed pages excluding cover page with:
   Section A: Ten (10) multiple choice questions (20%)
   Section B: Three (3) structured questions (80%)

2. Answer **ALL** questions.

3. Answer **Section A** in the multiple-choice answer sheet provided and **Section B** in the answer booklet provided.

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

There are TEN (10) questions in this section. Answer ALL questions on the multiple choice answer sheet.

1. The first step in solving a linear programming model using the simplex method is to convert the model into _____ form.
   A. standard
   B. Objective function
   C. slack
   D. assignment

2. Given the following linear programming model:

   Objective function, Maximize: $4X_1 + 3X_2$
   subject to:

   $4X_1 + 3X_2 \leq 23$
   $5X_1 - X_2 \leq 5$
   $X_1, X_2 \geq 0$

   What are the C_j values for the slack variables?
   A. 4
   B. 0
   C. 3
   D. 1

3. A _____ is a linear relationship representing a restriction on decision making.
   A. profit line
   B. corner point
   C. constraint
   D. linear programming

4. In a linear programming problem, **a valid objective function** can be represented as:
   A. Maximize $Z = 5xy$
   B. Maximize $Z = 5x^2 + 2y^2$
   C. Maximize $Z = \frac{x_1 + x_2}{x_3}$
   D. Maximize $Z = 3x + 3y + \frac{1}{3}z$

Continued...

5. The minimization of cost or maximization of profit is the _____.
   A. objective of operations management
   B. constraint of operations management
   C. limited resource of management science
   D. assumption of financially

6. If the daily demand is 25 and the lead time is 4 days, what is the reorder point?
   A. 80 units
   B. 100 units
   C. 25 units
   D. 11 units

7. A company distributes repair parts for high end appliances. The annual demand is 81,000 and the company operates 250 days per year. The annual carrying cost is 20% of the item cost, whereby the item cost is $500. The ordering cost is $60. Determine the optimal order quantity.
   A. 810 units
   B. 477.11 units
   C. 311.77 units
   D. 534.23 units

8. Inventory costs include
   A. holding cost.
   B. ordering cost.
   C. shortage costs.
   D. all of the above

9. EOQ is the optimal order quantity that will _____ total inventory costs.
   A. minimize
   B. maximize
   C. maintain
   D. change

10. In the basic EOQ model, if lead time increases from 5 to 10 days, the economic optimal quantity value will _____.
    A. double
    B. remain
    C. increase
    D. decrease

Continued...

SECTION B: STRUCTURED QUESTIONS (80 Marks)

There are THREE questions in this section. Candidates MUST answer ALL THREE questions.

Question 1 (30 Marks)

(a) Computers Unlimited sells microcomputers to colleges on the West Coast and ships them from factory A, B and C. The ordered microcomputers must be delivered by the beginning of the academic year. The transportation costs (in MYR) for various routes are provided in the table below:

Factory	College				Supply
	T	X	Y	Z	
A	5	4	5	6	400
B	6	3	4	4	300
C	6	4	4	5	300
Demand	300	300	240	200	

Find the initial solution using **Northwest Corner Method.** Then, determine the optimal transportation table and minimum total transportation cost.

(15 marks)

(b) In a car workshop, there are three tasks to be assigned to three workers. The table below indicates the daily profit (in MYR) achieved by assigning each worker to each job. Find the assignment that will **maximize** profit.

Worker	Job		
	I	II	III
Adam	80	90	85
Borhan	60	70	55
Chen	80	90	80

(15 marks)

Continued...

Question 2 (25 Marks)

Lakeland-Bering Aircraft Company is preparing a contract proposal to submit to the defense department for a new military aircraft, the X-300J jet fighter. Part of the proposal is a development and production schedule for completion of the first aircraft. The project consists of seven tasks. The tasks that must be accomplished in order to complete the project are listed as below:

Task	Immediate Predecessors	Time (weeks)		
		Optimistic	Most Likely	Pessimistic
A	-	6	8	10
B	A	5	7	9
C	B	7	9	11
D	A	5	6	7
E	B.D	5	7	9
F	C,E	1	2	3
G	E	4	8	12

(a) Design a network diagram based on the listed tasks.

(8 marks)

(b) Find the critical path and state the expected project completion time. Compute the earliest start time, latest start time, earliest finish time, latest finish time and slack time.

(17 marks)

Continued...

Question 3 (25 Marks)

Mr Sahor, the manager of the commercial loan department of a bank, must decide on allocation of loans. He can choose Strategy A, Strategy B or not to provide any loan. The profit (MYR) from each alternative depends on the economic conditions as given in the following table:

Alternative	Economic condition	
	Good economy (MYR)	Poor economy (MYR)
Strategy A	265 000	30 000
Strategy B	400 000	-50 000
No loan	0	0
Probability	0.7	0.3

(a) What is the decision under Maximax criterion?

(4 marks)

(b) Which option should be chosen through Maximin criteria?

(4 marks)

(c) Determine the highest payoff using Equally Likelihood criterion.

(5 marks)

(d) State the best decision through Criterion of Realism with $\alpha = 0.8$.

(6 marks)

(e) What decision would maximize the expected payoff?

(6 marks)

End of Questions.